1

2 What is claimed is:

3

4 1.   In a computer network having a plurality of nodes each of which has a DDB and

5 one of which should be master node used to maintain contents of said DDB in each of

6 said plurality of nodes consistent throughout said plurality in a manner to avoid a single

7 point of failure, said plurality of nodes including a first purported master node and a

8 second purported master node, a system for resolving conflict in said network between

9 said first purported master node and said second purported master node comprising:

10   means for establishing a standard for comparison between said first purported

11 master node and said second purported master node;

12   means for comparing said first purported master node against said second

13 purported master node in accordance with said standard to obtain comparison results;

14 and,

15   means for selecting said master node from the group of nodes consisting of said

16 first purported master node and said second purported master node based on said

17 comparison results.

18

19 2.   The system of claim 1 and further comprising:

20   means for demoting the remaining node in said group to non-master node status

21 as a participating node in said plurality of nodes.

22

1　3.　The system of claim 1 and wherein said comparison standard establishing means

2　establishes a temporal standard.

3

4　4.　The system of claim 3 and wherein said comparing means comprises:

5　　　means for choosing between said first purported master node and said second

6　purported master node if said first purported master node and said second purported

7　master node were selected simultaneously; and,

8　　　means for determining which one of said first purported master node and said

9　second purported master node was most recently selected to obtain a most recently

10　selected purported master node if said first purported master node and said second

11　purported master node were not selected simultaneously.

12

13　5.　The system of claim 4 and wherein said choosing means includes IP means for

14　picking said first purported master node if the IP address of said first purported master

15　node is lower than the IP address of said second purported master node and vice versa.

16

17　6.　The system of claim 4 and wherein said determining means comprises means for

18　picking said most recently selected purported master node as said master node.

19

20　7.　The system of claim 6 and wherein said picking means comprises:

21　　　first means for determining when said first purported master node was selected

22　master of said network to obtain a first time of selection;

1   second means for determining when said second purported master node was

2   selected said master of said network to obtain a second time of selection;

3   third means for comparing said first time with said second time to obtain said

4   most recently selected purported master node; and,

5   fourth means, responsive to operation of said third means, for allowing said most

6   recently selected purported master node to be said master node and for demoting other

7   than said most recently selected master node to non-master-node status as a participating

8   node in said plurality of nodes.

9

10   8.   The system of claim 7 and wherein said first means comprises:

11   fifth means, included within said first purported master node for recording first

12   purported master node local time of selection of said first purported master node as said

13   master node as recorded said first time of selection, for measuring duration of said

14   selection of said first purported master node to obtain a first selection duration, and for

15   communicating said first selection duration to all other of said nodes in said plurality.

16

17   9.   The system of claim 8 and wherein said second means comprises:

18   sixth means, included within said second purported master node for recording

19   second purported master node local time of selection of said second purported master

20   node as said master node as recorded said second time of selection, for measuring

21   duration of said selection of said second purported master node to obtain a second

22   selection duration, and for communicating said second selection duration to all other of

23   said nodes in said plurality.

1

2   10.   The system of claim 9 and wherein said third means comprises, for and within

3   each one of said plurality of nodes other than said first purported master node and said

4   second purported master node:

5   seventh means, for noting local time of receipt of communication of said first

6   selection duration and for subtracting said first selection duration from said local time of

7   receipt of said first selection duration to obtain first adjusted local time;

8   eighth means for noting local time of receipt of communication of said second

9   selection duration and for subtracting said second selection duration from said local time

10   of receipt of said second selection duration to obtain second adjusted local time;

11   ninth means for comparing said first adjusted local time and said second adjusted

12   local time to determine most recent adjusted local time; and,

13   tenth means for identifying either said first purported master node or said second

14   purported master node associated with said most recent adjusted local time.

15

16   11.   The system of claim 10 and wherein said third means further comprises:

17   eleventh means located within said first purported master node

18   comprising;

19   twelfth means for noting local time of arrival of said second selection

20   duration and for subtracting said second selection duration therefrom to obtain

21   first purported master node adjusted competitive local time;

1   thirteenth means for comparing said first purported master node adjusted

2   competitive local time with said first purported master node local time of

3   selection to obtain a first most recent selection time; and,

4   fourteenth means for identifying either said first purported master node or

5   said second purported master node associated with said first most recent selection

6   time.

7

8   12.   The system of claim 11 and wherein said third means further comprises:

9   fifteenth means located within said second purported master node

10   comprising;

11   sixteenth means for noting local time of arrival of said first selection

12   duration and for subtracting said first selection duration therefrom to obtain

13   second purported master node adjusted competitive local time;

14   seventeenth means for comparing said second purported master node

15   adjusted competitive local time with said second purported master node local time

16   of selection to obtain a second most recent selection time; and,

17   eighteenth means for identifying either said first purported master node or

18   said second purported master node associated with said second most recent

19   selection time.

20

21   13.   The system of claim 12 and further comprising:

22   summation means, operative with said tenth means, said fourteenth means and

23   said eighteenth means for tallying the number of times said first purported master node is

1   identified to obtain a first total and the number of times said second purported master

2   node is identified to obtain a second total;

3   if said first total equals said second total, tiebreaking means for choosing between

4   said first purported master node and said second purported master node; and,

5   if said first total does not equal said second total, final master node selection

6   means for selecting said first purported master node as master node if said first total is

7   greater than said second total and for selecting said second purported master node as

8   master node if said second total is greater than said first total.

9

10   14.   The system of claim 13 and wherein said tiebreaking means includes other IP

11   means for picking said first purported master node as said master node if the IP address

12   of said first purported master node is lower than the IP address of said second purported

13   master node and vice versa.

14

15   15.   The system of claim 13 and wherein said final master node selection means

16   includes demoting means for demoting said first purported master node to non-master

17   node status as a participating node within said plurality of nodes if said first total is less

18   than said second total, and for demoting said second purported master node to non-master

19   node status as a participating node within said plurality of nodes if said second total is

20   less than said first total.

21

1   16.   The system of claim 8 and wherein said fifth means includes means for

2   communicating via said DDB in said first purported master node to said DDB in each of

3   said all other of said nodes in said plurality.

4

5   17.   The system of claim 9 and wherein said sixth means includes means for

6   communicating via said DDB in said second purported master node to said DDB in each

7   of said all other of said nodes in said plurality.

8

9   18.   The system of claim 1 and wherein said network is globally-dispersed and at least

10   some of said plurality of nodes are located in different time zones from other of said

11   plurality of nodes.

12

13

14   19.   In a computer network having a plurality of nodes only one of which should be

15   master node for managing said plurality of nodes in a manner to avoid a single point of

16   failure, said plurality of nodes including a first purported master node and a second

17   purported master node, a system for resolving conflict in said network between said first

18   purported master node and said second purported master node comprising:

19   means for choosing between said first purported master node and said second

20   purported master node to obtain said master node.

21

22

1   20.   In a computer network having a plurality of nodes only one of which should be

2   master node used to maintain said plurality of nodes in a manner to avoid a single point

3   of failure, said plurality of nodes including a first purported master node and a second

4   purported master node, a system for resolving conflict in said network between said first

5   purported master node and said second purported master node comprising:

6   means for establishing a standard for comparison between said first purported

7   master node and said second purported master node;

8   means for comparing said first purported master node against said second

9   purported master node in accordance with said standard to obtain comparison results;

10   and,

11   means for selecting said master node from the group of nodes consisting of said

12   first purported master node and said second purported master node based on said

13   comparison results.

14

15

16   21.   In a computer network having a plurality of nodes each of which has a DDB and

17   one of which should be master node used to maintain contents of said DDB in each of

18   said plurality of nodes consistent throughout said plurality in a manner to avoid a single

19   point of failure, said plurality of nodes including a first purported master node and a

20   second purported master node, a method for resolving conflict in said network between

21   said first purported master node and said second purported master node comprising:

22   establishing a standard for comparison between said first purported master node

23   and said second purported master node;

1   comparing said first purported master node against said second purported master

2   node in accordance with said standard to obtain comparison results; and,

3   selecting said master node from the group of nodes consisting of said first

4   purported master node and said second purported master node based on said comparison

5   results.

6

7   22.   The method of claim 21 and further comprising:

8   demoting the remaining node in said group to non-master node status as a

9   participating node in said plurality of nodes.

10

11   23.   The method of claim 21 and wherein said comparison standard establishing

12   establishes a temporal standard.

13

14   24.   The method of claim 23 and wherein said comparing comprises:

15   choosing between said first purported master node and said second purported

16   master node if said first purported master node and said second purported master node

17   were selected simultaneously; and,

18   determining which one of said first purported master node and said second

19   purported master node was most recently selected to obtain a most recently selected

20   purported master node if said first purported master node and said second purported

21   master node were not selected simultaneously.

22

1   25.   The method of claim 24 and wherein said choosing includes picking said first

2   purported master node if the IP address of said first purported master node is lower than

3   the IP address of said second purported master node and vice versa.

4

5   26.   The method of claim 24 and wherein said determining comprises picking said

6   most recently selected purported master node as said master node.

7

8   27.   The method of claim 6 and wherein said picking comprises:

9   first determining when said first purported master node was selected master of

10   said network to obtain a first time of selection;

11   second determining when said second purported master node was selected said

12   master of said network to obtain a second time of selection;

13   third comparing said first time with said second time to obtain said most recently

14   selected purported master node; and,

15   allowing said most recently selected purported master node to be said master node

16   and demoting other than said most recently selected master node to non-master-node

17   status as a participating node in said plurality of nodes.

18

19   28.   The method of claim 27 and wherein said first determining comprises:

20   recording first purported master node local time of selection of said first purported

21   master node as said master node as recorded said first time of selection;

22   measuring duration of said selection of said first purported master node to obtain

23   a first selection duration; and,

1   communicating said first selection duration to all other of said nodes in said

2   plurality.

3

4   29.   The method of claim 28 and wherein said second determining comprises:

5   recording second purported master node local time of selection of said second

6   purported master node as said master node as recorded said second time of selection;

7   measuring duration of said selection of said second purported master node to

8   obtain a second selection duration; and,

9   communicating said second selection duration to all other of said nodes in said

10   plurality.

11

12   30.   The method of claim 29 to be practiced within each one of said plurality of nodes

13   other than said first purported master node and said second purported master node

14   comprising:

15   noting local time of receipt of communication of said first selection duration and

16   subtracting said first selection duration from said local time of receipt of said first

17   selection duration to obtain first adjusted local time;

18   noting local time of receipt of communication of said second selection duration

19   and subtracting said second selection duration from said local time of receipt of said

20   second selection duration to obtain second adjusted local time;

21   comparing said first adjusted local time and said second adjusted local time to

22   determine most recent adjusted local time; and,

1   identifying either said first purported master node or said second purported master

2   node associated with said most recent adjusted local time.

3

4   31.   The method of claim 30 to be practiced within said first purported master node

5   comprising:

6   noting local time of arrival of said second selection duration and subtracting said

7   second selection duration therefrom to obtain first purported master node adjusted

8   competitive local time;

9   comparing said first purported master node adjusted competitive local time with

10   said first purported master node local time of selection to obtain a first most recent

11   selection time; and,

12   identifying either said first purported master node or said second purported master

13   node associated with said first most recent selection time.

14

15   32.   The method of claim 31 to be practiced within said second purported

16   master node comprising:

17   noting local time of arrival of said first selection duration and subtracting said

18   first selection duration therefrom to obtain second purported master node adjusted

19   competitive local time;

20   comparing said second purported master node adjusted competitive local time

21   with said second purported master node local time of selection to obtain a second most

22   recent selection time; and,

1   identifying either said first purported master node or said second purported master

2   node associated with said second most recent selection time.

3

4   33.   The method of claim 32 comprising:

5   tallying the number of times said first purported master node is identified to

6   obtain a first total and the number of times said second purported master node is

7   identified to obtain a second total;

8   if said first total equals said second total, tiebreaking by choosing between said

9   first purported master node and said second purported master node; and,

10   if said first total does not equal said second total, final master node selection

11   selecting said first purported master node as master node if said first total is greater than

12   said second total and selecting said second purported master node as master node if said

13   second total is greater than said first total.

14

15   34.   The method of claim 33 and wherein said tiebreaking by choosing includes

16   picking said first purported master node as said master node if the IP address of said first

17   purported master node is lower than the IP address of said second purported master node

18   and vice versa.

19

20   35.   The method of claim 33 including:

21   demoting said first purported master node to non-master node status as a

22   participating node within said plurality of nodes if said first total is less than said second

23   total; and,

1   demoting said second purported master node to non-master node status as a

2   participating node within said plurality of nodes if said second total is less than said first

3   total.

4

5   36.   The method of claim 28 including:

6   communicating via said DDB in said first purported master node to said DDB in

7   each of said all other of said nodes in said plurality.

8

9   37.   The method of claim 29 including:

10   communicating via said DDB in said second purported master node to said DDB

11   in each of said all other of said nodes in said plurality.

12

13   38.   The method of claim 21 and wherein said network is globally-dispersed and at

14   least some of said plurality of nodes are located in different time zones from other of said

15   plurality of nodes.

16

17

18   39.   In a computer network having a plurality of nodes only one of which should be

19   master node for managing said plurality of nodes in a manner to avoid a single point of

20   failure, said plurality of nodes including a first purported master node and a second

21   purported master node, a method for resolving conflict in said network between said first

22   purported master node and said second purported master node comprising:

1   choosing between said first purported master node and said second purported

2   master node to obtain said master node.

3

4

5   40.   In a computer network having a plurality of nodes only one of which should be

6   master node used to maintain said plurality of nodes in a manner to avoid a single point

7   of failure, said plurality of nodes including a first purported master node and a second

8   purported master node, a method for resolving conflict in said network between said first

9   purported master node and said second purported master node comprising:

10   establishing a standard for comparison between said first purported master node

11   and said second purported master node;

12   comparing said first purported master node against said second purported master

13   node in accordance with said standard to obtain comparison results; and,

14   selecting said master node from the group of nodes consisting of said first

15   purported master node and said second purported master node based on said comparison

16   results.

17

18

19   41.   A computer program product for use in a computer network having a plurality of

20   nodes each of which has a DDB and one of which should be master node used to

21   maintain contents of said DDB in each of said plurality of nodes consistent throughout

22   said plurality in a manner to avoid a single point of failure, said plurality of nodes

23   including a first purported master node and a second purported master node, said

1   computer program product including a computer usable medium having computer

2   readable program code thereon for resolving conflict in said network between said first

3   purported master node and said second purported master node, said program code

4   comprising:

5   program code for establishing a standard for comparison between said first

6   purported master node and said second purported master node;

7   program code for comparing said first purported master node against said second

8   purported master node in accordance with said standard to obtain comparison results;

9   and,

10   program code for selecting said master node from the group of nodes consisting

11   of said first purported master node and said second purported master node based on said

12   comparison results.

13

14   42.   The computer program product of claim 41 and further comprising:

15   program code for demoting the remaining node in said group to non-master node

16   status as a participating node in said plurality of nodes.

17

18   43.   The computer program product of claim 41 and wherein said comparison standard

19   establishing program code establishes a temporal standard.

20

21   44.   The computer program product of claim 43 and wherein said comparing program

22   code comprises:

1   program code for choosing between said first purported master node and said

2   second purported master node if said first purported master node and said second

3   purported master node were selected simultaneously; and,

4   program code for determining which one of said first purported master node and

5   said second purported master node was most recently selected to obtain a most recently

6   selected purported master node if said first purported master node and said second

7   purported master node were not selected simultaneously.

8

9   45.   The computer program product of claim 44 and wherein said choosing program

10   code includes IP program code for picking said first purported master node if the IP

11   address of said first purported master node is lower than the IP address of said second

12   purported master node and vice versa.

13

14   46.   The computer program product of claim 44 and wherein said determining

15   program code comprises program code for picking said most recently selected purported

16   master node as said master node.

17

18   47.   The computer program product of claim 46 and wherein said picking program

19   code comprises:

20   first program code for determining when said first purported master node was

21   selected master of said network to obtain a first time of selection;

22   second program code for determining when said second purported master node

23   was selected said master of said network to obtain a second time of selection;

1   third program code for comparing said first time with said second time to obtain

2   said most recently selected purported master node; and,

3   fourth means, responsive to operation of said third means, for allowing said most

4   recently selected purported master node to be said master node and for demoting other

5   than said most recently selected master node to non-master-node status as a participating

6   node in said plurality of nodes.

7

8   48.   The computer program product of claim 47 and wherein said first program code

9   comprises:

10   fifth means, included within said first purported master node for recording first

11   purported master node local time of selection of said first purported master node as said

12   master node as recorded said first time of selection, for measuring duration of said

13   selection of said first purported master node to obtain a first selection duration, and for

14   communicating said first selection duration to all other of said nodes in said plurality.

15

16   49.   The computer program product of claim 48 and wherein said second program

17   code comprises:

18   sixth means, included within said second purported master node for recording

19   second purported master node local time of selection of said second purported master

20   node as said master node as recorded said second time of selection, for measuring

21   duration of said selection of said second purported master node to obtain a second

22   selection duration, and for communicating said second selection duration to all other of

23   said nodes in said plurality.

1

2   50.   The computer program product of claim 49 and wherein said third program code

3   comprises, for and within each one of said plurality of nodes other than said first

4   purported master node and said second purported master node:

5   seventh means, for noting local time of receipt of communication of said first

6   selection duration and for subtracting said first selection duration from said local time of

7   receipt of said first selection duration to obtain first adjusted local time;

8   eighth program code for noting local time of receipt of communication of said

9   second selection duration and for subtracting said second selection duration from said

10   local time of receipt of said second selection duration to obtain second adjusted local

11   time;

12   ninth program code for comparing said first adjusted local time and said second

13   adjusted local time to determine most recent adjusted local time; and,

14   tenth program code for identifying either said first purported master node or said

15   second purported master node associated with said most recent adjusted local time.

16

17   51.   The computer program product of claim 50 and wherein said third program code

18   further comprises:

19   eleventh program code located within said first purported master node

20   comprising;

21   twelfth program code for noting local time of arrival of said second

22   selection duration and for subtracting said second selection duration therefrom to

23   obtain first purported master node adjusted competitive local time;

1   thirteenth program code for comparing said first purported master node

2   adjusted competitive local time with said first purported master node local time of

3   selection to obtain a first most recent selection time; and,

4   fourteenth program code for identifying either said first purported master

5   node or said second purported master node associated with said first most recent

6   selection time.

7

8   52.   The computer program product of claim 51 and wherein said third program code

9   further comprises:

10   fifteenth program code located within said second purported master node

11   comprising;

12   sixteenth program code for noting local time of arrival of said first

13   selection duration and for subtracting said first selection duration therefrom to

14   obtain second purported master node adjusted competitive local time;

15   seventeenth program code for comparing said second purported master

16   node adjusted competitive local time with said second purported master node

17   local time of selection to obtain a second most recent selection time; and,

18   eighteenth program code for identifying either said first purported master

19   node or said second purported master node associated with said second most

20   recent selection time.

21

22   53.   The computer program product of claim 52 and further comprising:

1   summation means, operative with said tenth means, said fourteenth program code

2   and said eighteenth program code for tallying the number of times said first purported

3   master node is identified to obtain a first total and the number of times said second

4   purported master node is identified to obtain a second total;

5   if said first total equals said second total, tiebreaking program code for choosing

6   between said first purported master node and said second purported master node; and,

7   if said first total does not equal said second total, final master node selection

8   program code for selecting said first purported master node as master node if said first

9   total is greater than said second total and for selecting said second purported master node

10   as master node if said second total is greater than said first total.

11

12   54.   The computer program product of claim 53 and wherein said tiebreaking program

13   code includes other IP program code for picking said first purported master node as said

14   master node if the IP address of said first purported master node is lower than the IP

15   address of said second purported master node and vice versa.

16

17   55.   The computer program product of claim 53 and wherein said final master node

18   selection program code includes demoting program code for demoting said first

19   purported master node to non-master node status as a participating node within said

20   plurality of nodes if said first total is less than said second total, and for demoting said

21   second purported master node to non-master node status as a participating node within

22   said plurality of nodes if said second total is less than said first total.

23

1   56.   The computer program product of claim 48 and wherein said fifth program code

2   includes program code for communicating via said DDB in said first purported master

3   node to said DDB in each of said all other of said nodes in said plurality.

4

5   57.   The computer program product of claim 49 and wherein said sixth program code

6   includes program code for communicating via said DDB in said second purported master

7   node to said DDB in each of said all other of said nodes in said plurality.

8

9   58.   The computer program product of claim 41 and wherein said network is globally-

10   dispersed and at least some of said plurality of nodes are located in different time zones

11   from other of said plurality of nodes.

12

13

14   59.   A computer program product for use in a computer network having a plurality of

15   nodes only one of which should be master node for managing said plurality of nodes in a

16   manner to avoid a single point of failure, said plurality of nodes including a first

17   purported master node and a second purported master node, said computer program

18   product including a computer usable medium having computer readable program code

19   thereon for resolving conflict in said network between said first purported master node

20   and said second purported master node, said program code comprising:

21   program code for choosing between said first purported master node and said

22   second purported master node to obtain said master node.

23

1

2   60.   A computer program product for use in a computer network having a plurality of

3   nodes only one of which should be master node used to maintain said plurality of nodes

4   in a manner to avoid a single point of failure, said plurality of nodes including a first

5   purported master node and a second purported master node, said computer program

6   product including a computer usable medium having computer readable code thereon for

7   resolving conflict in said network between said first purported master node and said

8   second purported master node, said program code comprising:

9   program code for establishing a standard for comparison between said first

10   purported master node and said second purported master node;

11   program code for comparing said first purported master node against said second

12   purported master node in accordance with said standard to obtain comparison results;

13   and,

14   program code for selecting said master node from the group of nodes consisting

15   of said first purported master node and said second purported master node based on said

16   comparison results.

17

18

19   61.   In a computer network having a plurality of nodes each of which has a DDB and

20   one of which should be master node used to maintain contents of said DDB in each of

21   said plurality of nodes consistent throughout said plurality in a manner to avoid a single

22   point of failure, said plurality of nodes including a first purported master node and a

1   second purported master node, apparatus for resolving conflict in said network between

2   said first purported master node and said second purported master node comprising:

3   a first device that establishes a standard for comparison between said first

4   purported master node and said second purported master node;

5   a second device that compares said first purported master node against said

6   second purported master node in accordance with said standard to obtain comparison

7   results; and,

8   a third device that selects said master node from the group of nodes consisting of

9   said first purported master node and said second purported master node based on said

10   comparison results.

11

12

13   62.   In a computer network having a plurality of nodes only one of which should be

14   master node for managing said plurality of nodes in a manner to avoid a single point of

15   failure, said plurality of nodes including a first purported master node and a second

16   purported master node, apparatus for resolving conflict in said network between said first

17   purported master node and said second purported master node comprising:

18   a device that chooses between said first purported master node and said second

19   purported master node to obtain said master node.

20

21

22   63.   In a computer network having a plurality of nodes only one of which should be

23   master node used to maintain said plurality of nodes in a manner to avoid a single point

1   of failure, said plurality of nodes including a first purported master node and a second

2   purported master node, apparatus for resolving conflict in said network between said first

3   purported master node and said second purported master node comprising:

4   a first device that establishes a standard for comparison between said first

5   purported master node and said second purported master node;

6   a second device that compares said first purported master node against said

7   second purported master node in accordance with said standard to obtain comparison

8   results; and,

9   a third device that selects said master node from the group of nodes consisting of

10   said first purported master node and said second purported master node based on said

11   comparison results.

12

13